National Institute of Environmental Health Sciences

Ties Between Air Quality and Climate Change in South Africa and their Impact on Human Health

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Abstract:

Poster number Th265a presented in poster presentation Session C42: Air Quality and Effects of Aerosols and Pollution, 27 October 2011. The relationship between air quality and climate change in South Africa, as well as the resultant health impacts, are not well understood and pose a unique challenge as these problems are a blend of those faced by both developing and developed countries. For example, the major anthropogenic sources of air pollutants include sources such as industrial emissions, emissions from domestic burning of wood, coal and paraffin for cooking and heating, and vehicular emissions. This deteriorating air quality in South Africa has large impacts on human health, with indoor air pollution and urban air pollution ranking fifteenth and seventeenth, respectively, as risk factors causing the national burden of disease (MRC, 2008). Recently, the National Air Quality Act was passed that set standards for the ambient concentration of criteria pollutants, which will be regulated through Air Quality Management Plans. However, air quality, its management and its resultant health impacts are all impacted by a changing climate; and very little is known on how air quality in South Africa may be impacted on by regional climate change. In addition, through increasing temperatures, climate change itself has the potential to directly impact human health, thus adding another risk factor to an already compromised health situation. Due to these interactions, understanding and appropriately planning to effectively mitigate health impacts due to air pollution and climate change is a complex and multi-faceted problem. In this project, areas within South Africa that are at risk of negative health impacts from both deteriorating air quality and climate change were identified. In order to understand how changing temperatures will impact South African's health from seasonal to century-long time scales, projections of temperature and relative humidity were produced across timescales. This information was translated into potential health impacts utilizing a heat index. In order to understand the potential for deteriorating air quality to impact human health, historical and current data of the near-surface ozone and aerosol particle concentrations were mapped nationally and related to their potential health impacts. These projections and air quality data were combined spatially in order to understand a) which areas may be at risk for both climate change related health impacts and air quality related health impacts; b) the potential combination of air quality and climate change related health impacts; and c) where air quality management may be most vulnerable to changes in climate. Utilizing this information, it will now be possible to focus research efforts into these areas to understand how air quality may change with a changing climate and the resultant impact on human health.

Source: http://www.wcrp-climate.org/conference2011/abstracts/C42/Garland_C42_TH265A.pdf

Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Air Pollution, Indoor Environment, Temperature

Air Pollution: Interaction with Temperature, Ozone, Other Air Pollution

Air Pollution (other): aerosols

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: South Africa

Health Co-Benefit/Co–Harm (Adaption/Mitigation): ☑

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content